We claim:

1. A method of receiving a wireless communication having at least two signals selected from the group comprising GMSK signals and 8PSK signals (with interference between the signals), comprising the steps of:

Receiving the incoming signals;

Rotating the raw incoming signals in complex space with a factor such that the GMSK signal is binary modulated;

Detecting the rotated signal as two signal streams composed of real (I) and imaginary (Q) signals in a detector;

Processing the I and Q signal streams with a MIMO filter; and

Processing the output of the MIMO filter with a joint reduced state sequence estimator based on the filtered channel impulse response

2. A method according to claim 1, in which the desired signal is an 8PSK signal; a set of 8PSK training symbols are rotated by $e^{j(\theta k - \phi k)}$; and
channel estimation parameters are found by one of a maximal likelihood (ML), or a least minimum mean square error estimation procedure.

3. A method according to claim 2, in which the interfering signal is an 8PSK signal.

4. A method according to claim 2, in which the interfering signal is a GMSK signal.

5. A method according to claim 1, in which the interfering signal is an 8PSK signal; a set of interfering 8PSK training symbols are rotated by $e^{j(\theta k - \phi k)}$; and

channel estimation parameters are found by one of a least squares or a least minimum mean square error estimation procedure.

6. A method according to claim 5, in which the desired signal is an 8PSK signal.

7. A method according to claim 5, in which the desired signal is a GMSK signal.

8. A method of sending a wireless communication comprising the steps of:

transmitting on a channel from two or more spatially separated antennas at least two signals selected from the group comprising GMSK signals and 8PSK signals (with interference between the signals),

Receiving the incoming signals;

Rotating the raw incoming signals in complex space with a factor such that the GMSK signal is binary modulated;

Detecting the rotated signal as two signal streams composed of real (I) and imaginary (Q) signals in a detector;

Processing the I and Q signal streams with a MIMO filter; and

Processing the output of the MIMO filter with a joint reduced state sequence estimator based on the filtered channel impulse response

9. A method according to claim 8, in which a first signal is an 8PSK signal;
a set of 8PSK training symbols are rotated by $e^{j(\theta k - \phi k)}$; and
channel estimation parameters are found by one of a least squares or a least minimum mean square error estimation procedure.

10. A method according to claim 9, in which a second signal is an 8PSK signal.

11. A method according to claim 9, in which a second signal is a GMSK signal.

12. A wireless transmission system comprising:
At least one base station having at least two spatially separated antennas and at least one RF unit for transmitting one of a GMSK and an 8PSK transmission signal along each of said two spatially separated antennas;
At least one receiving station, having a single antenna, for communicating with said base station; in which
Said receiving station has processor means for applying interference cancellation to a composite input signal comprising a combination of a first signal and a second signal interfering with said first signal, thereby reducing interference between said first signal and said second signal.

13. A system according to claim 12, in which said base station transmits two transmission signals on the same channel.

14. A system according to claim 13, in which said two transmissions signals comprise two GMSK signals.

15. A system according to claim 13, in which said two transmissions signals comprise two 8PSK signals.

16. A system according to claim 13, in which said two transmissions signals comprise one 8PSK signal and one GMSK signal.

17. A system according to claim 12, in which said receiving station comprises means for evaluating the modulation type of an interfering signal and for estimating

channel parameters of said interfering signal.

18. A system according to claim 17, in which said channel parameters of said interfering signal are estimated by calculating channel parameters for all combinations of a desired signal and of said interfering signal and selecting the channel parameters that meet a criterion.

19. A system according to claim 17, further comprising means for:
detecting whether said system is in a first transmission mode in which said interfering signal is to be discarded or is in a second transmission mode in which said first signal and said second signal are both to be processed as data; and
processing said second signal in accordance with said transmission mode.

20. A method of receiving a wireless communication comprising M1 GMSK signals, M2 8PSK signals and an additive noise component, comprising the steps of:

Receiving the incoming signals;

Rotating the raw incoming signals in complex I/Q space with a factor such that the GMSK signal is binary modulated;

Detecting the rotated signal as two signal streams composed of real (I) and imaginary (Q) signals in a detector;

Processing the I and Q signal streams with a MIMO filter; and

Processing the output of the MIMO filter with a joint reduced state sequence estimator based on the filtered channel impulse response

21. A method according to claim 20, in which M1 = 0 and M2 = 1 and the step of

processing comprises blind interference suppression of a GMSK interferer.

22. A method according to claim 20, in which M1 = 1 and M2 = 1 and the step of processing comprises joint detection of one GMSK and one 8PSK signal.

23. A method according to claim 20, in which M1 = 0 and M2 = 2 and the step of processing comprises joint detection of two 8PSK signals with suppression of GMSK interference through I-Q whitening.

24. A method according to claim 20, in which M1 = 2 and M2 = 0 and the step of processing comprises joint detection of two GMSK signals with suppression of GMSK interference through I-Q whitening.